

regard Carnot's principle, which includes the law of uniformity of temperature and is the basis of the whole theory, as a property of statistical type confined to stable or permanent aggregations of matter. Thus no dynamical proof from molecular considerations could be regarded as valid unless it explicitly restricted the argument to permanent systems; yet the conditions of permanency are unknown except in the simpler cases. The only mode of discussion that is yet possible is the method of dynamical statistics of molecules introduced by Maxwell. Now statistics is a method of arrangement rather than of demonstration. Every statistical argument requires to be verified by comparison with the facts, because it is of the essence of this method to take things as fortuitously distributed except in so far as we know the contrary; and we simply may not know essential facts to the contrary. For example, if the interaction of the æther or other cause produces no influence to the contrary, the presumption would be that the kinetic energy acquired by a molecule is, on the average, equally distributed among its various independent modes of motion, whether vibrational or translational. Assuming this type of distribution to be once established in a gaseous system, the dynamics of Boltzmann and Maxwell show that it must be permanent. But its assumption in the first instance is a result rather of the absence than of the presence of knowledge of the circumstances, and can be accepted only so far as it agrees with the facts; our knowledge of the facts of specific heat shows that it must be restricted to modes of motion that are homologous. In the words of Maxwell, when he first discovered in 1860, to his great surprise, that in a system of colliding rigid atoms the energy would always be equally divided between translatory and rotatory motions, it is only necessary to assume, in order to evade this unwelcome conclusion, that "something essential to the complete statement of the physical theory of molecular encounters must have hitherto escaped us."

Our survey thus tends to the result, that as regards the simple and uniform phenomena which involve activity of finite regions of the universal æther, theoretical physics can lay claim to constructive functions, and can build up a definite scheme; but in the domain of matter the most that it can do is to accept the existence of such permanent molecular systems as present themselves to our notice, and fit together an outline plan of the more general and universal features in their activity. Our well-founded belief in the rationality of natural processes asserts the possibility of this, while admitting that the intimate details of atomic constitution are beyond our scrutiny and provide plenty of room for processes that transcend finite dynamical correlation.

#### NOTES.

M. FAYE has been elected a Foreign Member of the Reale Accademia dei Lincei of Rome.

DR. OUSTALET has been appointed professor of zoology in the Paris Natural History Museum, in succession to the late Prof. Milne-Edwards.

WE regret to see the announcement of the death of Mr. Henry Sidgwick, late professor of moral philosophy at Cambridge.

SIR JOHN B. LAWES, BART., F.R.S., whose agricultural experiments at Rothamsted are of world-wide renown, died on Friday last, at eighty-six years of age.

THE announcement in *Science* that Prof. J. E. Keeler director of the Lick Observatory, and the author of many important papers on astrophysics, died in San Francisco on August 12, from the effects of heart disease, will be received by astronomers with much regret. Prof. Keeler was only forty-three years of age.

IT has been officially notified that a death which occurred in hospital at Glasgow on Monday in last week was due to true bubonic plague. The presence of the disease is suspected in several cases of illness under treatment.

THE Committee on Water-tube Boilers in the Navy has now been completed by the selection of Dr. John Inglis, lately

president of the Institution of Engineers and Shipbuilders in Scotland, and vice-president of the Institution of Naval Architects.

THE Melbourne correspondent of the *Times* states that, in compliance with a request of the Royal Geographical Society and other British scientific bodies, Prof. Baldwin Spencer has received leave of absence from the Melbourne University for one year, to enable him to study the customs and beliefs of the natives of the northern portion of South Australia.

THE Berlin Academy of Sciences has made the following grants, in addition to those already announced (p. 394). Dr. Holtermann, Berlin, for a botanical expedition to Ceylon, 4000 marks; Prof. Ludolf Krehl, Greifswald, for experiments on respiration, 1500 marks; Prof. Julius Tafel, Würzburg, for the continuation of his work on electrolysis, 100 marks; Dr. Benno Wandolleck, Dresden, for the investigation of the morphology of diptera, 800 marks.

THE names of one hundred eminent Americans no longer living are to be engraved in the Hall of Fame of the New York University. *Science* states that the following names of men of science have been proposed: John Adams Audubon, Spencer F. Baird, Alexander D. Bache, Nathaniel Bowditch, William Chauvenet, Henry Draper, James P. Espy, Asa Gray, Robert Hare, Joseph Henry, Edward Hitchcock, Isaac Lea, Matthew Fontaine Maury, Marie Mitchell, Benjamin Peirce, David Rittenhouse, Benjamin Silliman, Benjamin Thompson, John Torrey.

THE Marconi Wireless Telegraph Company have contracted to supply the Admiralty with Marconi apparatus for thirty-two ships and stations. The test of efficiency which has to be satisfied is that the instruments shall enable communication to be carried on between a fitted ship in Portsmouth Harbour and a fitted ship at Portland, a distance of about sixty-five miles, with a good deal of land between, including the Dorsetshire Hills, making it about ninety miles by sea. A trial set of the apparatus successfully fulfilled the conditions a few days ago.

THE death is announced of Dr. W. H. Lowe, formerly president of the Royal College of Physicians of Edinburgh. Dr. Lowe held several important positions in Edinburgh, among others those of president of the Royal Medical Society, and vice-president, subsequently president, of the Royal Botanic Society. He was elected a Fellow of the Royal College of Physicians of Edinburgh in 1846, and president of that college in 1873. At the meeting of the British Medical Association in Edinburgh in 1875 he presided over the section of psychology, and delivered the address before that section.

THE eleventh annual general meeting of the members of the Institution of Mining Engineers will be held at Bristol on Tuesday, September 18. Among the papers to be read, or taken as read, are the following:—The geological features of the Somerset and Bristol coal-field, with special reference to the physical geology of the Somersetshire Basin, by Mr. James McMurtrie; methods of working the thin coal-seams of the Bristol and Somerset coal-field, by Mr. George E. J. McMurtrie; the analogy between the gold "cintas" of Columbia and the auriferous gravels of California, by Mr. Edward Gledhill; the theory of the equivalent orifice treated graphically, by Mr. H. W. Halbaum; development and working of minerals in the Leon district, Spain, by Mr. J. A. Jones; and the geological age of the gold-deposits of Victoria, Australia, by Mr. James Stirling.

THE programme of the meeting of the Iron and Steel Institute, to be held in Paris on September 18-21, under the presidency of Sir William Roberts-Austen, has just been issued.

The following are subjects of papers to be brought before the meeting:—The development of the iron and steel industries in France since 1889, by H. Pinget; iron and steel from the point of view of the "phase-doctrine," by Prof. Bakhuis-Roozeboom; iron and steel at the Paris Exhibition, by Prof. H. Bauerman; American methods of testing iron and steel, by Mr. Albert Ladd Colby; rolling-mills, by Mr. Louis Katona; the constitution of slags, by Baron H. von Jüptner; a new method of producing high temperatures, by Mr. Ernest F. Lange; the action of aluminium on the carbon of cast iron, by Messrs. Godfrey Melland and H. W. Waldron; the present position of the solution theory of carburised iron, by Dr. A. Stansfeld; iron and phosphorus, with appendixes on (1) eutectics, (2) solid solutions, (3) method of determining free phosphide of iron in iron and steel, and (4) heat-tinting metal sections for microscopic examination, by Mr. J. E. Stead.

WE learn from the *Forres, Elgin and Nairn Gazette* of August 29 that a serious flood, due to the bursting of the Sanquhar reservoir on the morning of August 23, wrought great havoc over the western part of Forres. Since the great Moray floods of 1829, described by Sir Thomas Dick Lauder, the district has not suffered such a disaster. In that year the Findhorn was the main cause of flooding; in the present case injury was done by the breaking down of the embankment which dammed up the waters in a valley on the Sanquhar estate to the east of the Findhorn and a little south of Forres. The dam formed a reservoir of from eight to twelve acres. On Wednesday morning, August 22, the area was only partially covered with water, from eight to ten feet below the level of the overflow. Within twelve hours an inch and a half of rain fell. The reservoir filled rapidly, and by 3 a.m. on Thursday the water was rushing down the overflow, which was only thirty feet wide. Shortly before 5 a.m. the immense breastwork burst outwards from top to bottom in one mass, about twenty feet wide, close to the overflow, and the waters rushed wildly out. Near by an iron bridge with a concrete pier, 30 feet broad and 4 feet thick, were carried away, an ash tree was uprooted, and the waters spread rapidly over the low grounds in a wave that gathered to a height of three or four feet. Sheaves of barley and oats were carried off, wooden outhouses were torn away, stone walls, iron railings, gates and glasshouses were broken down, doors were driven in and a number of villas and cottages were submerged for some time to a depth of from three to five feet. Fortunately no lives were lost.

WITH reference to the inquiry as to the functions of the protruding filaments of the caterpillar of the Puss Moth (p. 385), we have received communications from several correspondents, who all agree with Mr. W. F. Kirby (p. 413) in regarding the appendages as chiefly intended for driving away Ichneumon Flies.

A NOTE in the *Electrician* refers to a curious effect produced by severe thunderstorms upon the glow lamps on the circuits of the Calcutta Electric Supply Co. It appears that immediately following each lightning flash the brightness of the glowing lamps has been observed to increase suddenly, gradually returning to the normal incandescence. This phenomenon has so frequently been observed that the engineers of the company have sought every possible explanation of the curious phenomenon, but have been unable to find any defect in their circuits—which are on the overhead wire system—that might offer an explanation. Indeed, the only conceivable explanation is one which appears so extraordinary that many may find considerable difficulty in accepting it. It is well known that carbon, acting as a coherer in a wireless telegraph apparatus, undergoes the usual sudden decrease in resistance when subjected to electric radiation. It is suggested that the carbon filaments

of a glowing lamp may undergo a similar change when exposed to the influence of a tropical thunderstorm in its immediate vicinity. This sudden decrease in the resistance of the filament would, of course, produce a correspondingly rapid increase in its candle-power, after which the gradual self-decoherence of the carbon would account for the return of the lamp to its normal incandescence.

WE have received an interesting account of the climate of Norway, by Mr. A. S. Steen, being a reprint from the Official Publication for the Paris Exhibition, 1900. As that country stretches through more than 13 degrees of latitude and extends nearly 300 miles beyond the Arctic Circle, the most varied shades of continental and maritime climates are represented within its confines. Mr. Steen has divided the country into south-east, west and north sections, this being in fact in accordance with nature's own division. In the inland districts of south-east Norway and Finmark we have examples of the most typical inland climate, viz. severe winter and relatively high temperature maxima in summer, and small rainfall; while along the whole length of coast-line the winter is unusually mild, the summer cool, and rain falls in abundance. The influence of the Gulf Stream can be traced all over the country, and it is one of the chief agencies to which Norway owes its condition as a civilised inhabited State to its farthest bounds on the shores of the Polar Sea. The following are quoted as some of the highest summer temperatures: in the south-east 86° and upwards, and 93° at Christiania (once only); on the south coast no higher temperature than 80°·5 has ever been recorded. In the west, temperatures of 88°·5, and once 93° at Vossevangen, have been recorded. In the northern section temperatures of 85° to 88° have been recorded, but in the most southern of the Lofoten Isles (in the middle of the ocean) the thermometer has never risen above 68°.

A PAPER, by Mr. A. E. Sunderland, on applications of electrochemistry in dye and print works, is published in the *Society of Arts Journal* (August 24). The requirements which should be fulfilled by a machine for electrical dyeing are considered to be as follows:—(1) The poles must not be of metal, but of carbon or biscuit porcelain, which conduct by becoming saturated with the electrolyte. (2) They must be as near to one another as possible. (3) The cloth must pass between the poles in the open width. (4) The poles may be perfectly smooth, and preferably cylindrical, revolving freely. These particulars are necessary, because in the ordinary passage of the electric current across any dye solution, the tendency of the dye is to concentrate itself around the negative pole, and not to circulate freely in the whole dye vessel; there is thus always a great danger of unevenness. In the finishing of goods the peculiar effect which is produced by calendering a piece in two different directions, one impression upon another, is well known. This is technically termed water-marking or moire, and is due to the irregular reflection from the surface of the material, one part of the light being totally reflected, and the other part dispersed. The effect can be introduced in several ways, one of which depends upon electricity. This process, Mr. Sunderland remarks, resolves itself practically into the local application of electrolysis. A platinum plate of suitable size is connected with the positive pole of the source of current. On this conducting surface is placed some absorbent material saturated with a solution of common salt. On this pad is placed the fabric to be water-marked, and the plate engraved with the water-mark connected with the negative terminal is pressed down upon it. The salt solution is decomposed, and a facsimile of the water-mark is printed on the cloth. To produce opaque designs, the absorbent material is saturated with a solution of barium chloride, which is decomposed on passing the current.

IN the *Atti dei Lincei*, ix. 2, Dr. A. Campetti describes experiments made with common salt and copper sulphate tending to prove that there exists a difference of potential between a solid salt and its unsaturated solution, this difference of potential being of the same order of magnitude and sign as the difference of potential between a more concentrated and a less concentrated solution of the same salt.

THE question as to whether evaporation from the surface of an electrified liquid produces a loss of electricity is one of considerable interest in connection with theories of atmospheric electricity. An investigation of this point is given by Signori A. Pochettino and A. Sella in the *Atti dei Lincei*, ix. 1. The method employed was to examine the rate at which an electrified plate lost its charge under the varying conditions when its surface was dry or was covered with a layer of water, and when it was exposed to a current of dry air or air saturated with watery vapour. The results tabulated show that the loss is more rapid in dry air than in saturated air, that with saturated air the presence or absence of the layer of water makes no practical difference, but that with dry air the discharge is actually slightly less rapid when the plate is wet than when it is dry. It is inferred that evaporation does not produce loss of charge, that the difference between dry air and saturated air is due to the fact that the dry air was ionised, while all trace of ionisation had been removed from the saturated air, and that the greater insulation obtained with dry air by wetting the plate was due to the ionisation being partially removed by the evaporation from the plate.

IN a paper published in the *Proceedings* of the Cambridge Philosophical Society, Mr. Barrett-Hamilton suggests that the (pathological) changes of colour and form which occur in certain Salmonoids during the breeding season may afford a clue to the origin of secondary sexual characters in animals in general. "Once," writes the author, "the existence of such a primitive state of things characterised by growth or discoloration of the whole or part of the body is admitted, we have therein the starting-point whence natural selection by alteration, suppression or accentuation of the details might easily produce many or all the nuptial changes of animals as we now see them, evolving in each a structure suitable to its own particular need, whether in eye, as in the Eel, in snout, as in the Salmon, or in hind-limb, as in Lepidosiren.

*Indian Museum Notes* (vol. v. No. 1) contains an interesting paper, by Mr. E. E. Green, on Indian Scale-insects (Coccidæ), showing the great increase which has recently taken place in our knowledge of their various groups. So late as 1886 only seven Indian representatives of the family were recorded, the well-known Wax-insect (*Ceroplastes ceriferus*) being one. Now thirty-seven species, distributed among fourteen genera, are known from Continental India, although this represents only a very small proportion of the real number. Not only are these insects interesting from their structure and their beauty of form and colour, but some are of commercial importance. The remainder of the number treats of various insect pests, notably those infesting tea and coffee plants, and those destructive to cereals and crops.

THE distribution of the Ruff in Ireland forms the subject of an interesting paper, by Mr. C. L. Patten, in the *Irish Naturalist* for August.

THE July number of the *Agricultural Gazette* of New South Wales maintains the usual high and useful character of this journal, an article on the important part played by bacteria in soil being of especial interest to the scientific agriculturist.

FROM the Indian Museum we have received "Illustrations of the Shallow-Water Ophiuroidea collected by the *Investigator*," by Dr. K. Koehler, published by the trustees. The specimens described are figured in eight plates.

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To the last issue of the *Journal* of the Asiatic Society of Bengal for 1899, Mr. F. Finn contributes a paper on Indian Weaver Finches (Ploceidæ), in the course of which he shows how a supposed new species has been named on a specimen of a well-known bird in its summer plumage.

MALACOLOGISTS will find much to interest them in the sheets of the *Proceedings* of the Philadelphia Academy last to hand, Mr. H. A. Pilsbry communicating four papers dealing respectively with the land snails of Japan, South America, Australia and Polynesia, and India.

*Science Gossip* for September contains an interesting article, by Mr. R. J. Hughes, on the colouring of shells, in which he demonstrates that the most common pigment among those of northern Europe is the sesquioxide of iron. Another paper in the same number forms the continuation of "Geological Notes in the Orange River Colony," by Major Skinner, R.A.M.G.

IN the July number of the *American Naturalist*, Prof. H. L. Osborn describes a remarkable Axolotl from Dakota, which appears different from any named form, and may indicate a new type. In the course of his paper the author raises the question whether we yet know the adult of the true Mexican Axolotl, the specimens that have developed into Salamanders being from the United States and perhaps specifically distinct.

WE have received three fascicules of the "Results of the Branner-Agassiz Expedition to Brazil," in course of publication in the *Proceedings* of the Washington Academy. Two of these, written by ladies, are devoted to Crustacea, while the third, by Mr. C. H. Gilbert, deals with the fishes. When ladies appear as authors of papers, it is much to be desired that they should prefix "Mrs." or "Miss" to their names, as it is otherwise often difficult to ascertain their proper titles.

MENTION in these columns has already been made of Mr. G. S. Miller's work on Old World mammals, and we have now received a paper, communicated by that naturalist to the *Proceedings* of the Washington Academy of Sciences (vol. ii. pp. 203-246), in which he describes a very large number of new species, mainly Rodents, collected by Dr. W. L. Abbott on islands in the North China Sea. Many of these are rats and mice.

THE publication of Prof. E. Morselli's free course of lectures on man from an evolutionary point of view is still proceeding, and the fascicules when bound together will form an interesting volume on physical anthropology, or, as the author terms it, *Antropologia générale*. The last number to hand (No. 45) concludes the section on the brain, and commences an account of the progenitors of man.

THERE is always something of interest in our well illustrated contemporary, *The Reliquary and Illustrated Archaeologist*. The July number contains some architectural notes from Monmouthshire, by Mr. J. Russell Larkby, illustrated by numerous sketches, and a short paper, by Mr. R. E. Head, on lace bobbins; these are often decorated in various ways, and different parts of the country furnish local types.

THOSE who are interested in criminal anthropology will find in a recent number of the *Bulletin de la Société d'Anthropologie de Paris* (Tome x. 4<sup>e</sup> série, p. 453) a psycho-physiological, medico-legal, and anatomical study of an atrocious criminal named Vacher, by MM. J. V. Laborde, Manouvrier, Papillaut and Gellé. It is strange that studies of this kind are never made in this country. It is quite time that physical anthropology and psychology were more directly recognised by persons interested in criminology.

SIR ARCHIBALD GEIKIE'S "Outlines of Field Geology" (Macmillan) has been the counsellor and friend of many young geologists and intelligent observers of the earth's features. A

new edition—containing numerous alterations and additions, while retaining the original form—has just been published, and it should be possessed by every lover of country rambles or teacher of earth-knowledge.

A BULKY volume, containing "Agricultural Statistics of British India for the years 1894-95 to 1898-99," has just been distributed by the Department of Revenue and Agriculture of the Government of India. The tables show (1) total average, classification of areas, irrigation, fallow land, area under crops, and stock; (2) prices of produce; (3) incidence of the land revenue on area and population; (4) varieties of tenure held direct from Government; (5) register of transfers of landed property; and (6) yields of principal crops.

THE additions to the Zoological Society's Gardens during the past week include a Green Monkey (*Cercopithecus callitrichus*, ♂) from West Africa, presented by Mr. C. A. Gilbert; two Boschboks (*Tragelaphus sylvaticus*) from South Africa, presented by Dr. A. MacCarthy Morrough; a Rufous-necked Wallaby (*Macropus ruficollis*) from New South Wales, presented by Miss Seymour; a Germain's Peacock Pheasant (*Polyplectron germaini*) from Cochinchina, presented by Mr. Arthur Yates; a Common Boa (*Boa constrictor*) from South America, presented by Mr. G. R. Fairbanks; two Red-bellied Squirrels (*Sciurus variegatus*) from South America, a Yellow-fronted Amazon (*Chrysotis ochrocephala*) from Guiana, ten Roofed Terrapins (*Kachuga tectum*) from India, deposited; a Wapiti Deer (*Cervus canadensis*), two Collared Fruit Bats (*Cynonycteris collaris*), born in the Gardens; two White Ibises (*Endocinus albus*), bred in the Gardens.

OUR ASTRONOMICAL COLUMN.

EPHEMERIS FOR OBSERVATIONS OF EROS.—In the last issue of the *Astronomische Nachrichten* (Bd. 153, No. 3660), Signor E. Millosevich gives a revised ephemeris of this asteroid for the next few weeks:—

*Ephemeris for 12h. Berlin Mean Time.*

1900.	R.A.			Decl.
	h.	m.	s.	
Sept. 6	2	27	24.16	+ 35 29 53.7
7	28	28	18	35 52 13.0
8	29	30	7.3	36 14 36.1
9	30	31	7.7	36 37 2.8
10	31	31	22	36 59 33.0
11	32	29	0.3	37 22 6.8
12	33	25	1.3	37 44 43.9
13	2	34	19.43	+ 38 7 24.2

COMET SWIFT (1894 IV).—Mr. F. H. Seares has calculated the osculating elements, and from them computed a finding ephemeris for this comet, which may possibly have some connection with the lost comet of De Vico. As it is important, however, that the comet should again be observed before any further attempt is made to establish such connection, he hopes that all possessing the necessary optical power will prosecute the search for it (*Astronomische Nachrichten*, Bd. 153, No. 3656)

Osculating Elements.

Epoch and Osculation 1900 July 23<sup>o</sup> Berlin Mean Time.

$$\begin{aligned} M &= 317^{\circ} 16' 15'' \\ \pi &= 348^{\circ} 56' 56'' \\ \Omega &= 24^{\circ} 50' 38.8'' \\ i &= 3^{\circ} 35' 17.0'' \\ \phi &= 31^{\circ} 2' 30.2'' \\ \mu &= 554'' \cdot 3823 \end{aligned} \quad 1900^{\circ}$$

*Ephemeris for Berlin Mean Midnight.*

1900.	R.A.			Decl.
	h.	m.	s.	
Sept. 9	16	27	21	- 25 21.9
13	32	57		25 30.5
17	38	55		25 39.1
21	45	15		25 47.5
25	51	56		25 55.6
29	16	58	57	- 26 3.1

THE NEW SPECTROGRAPHS FOR THE POTSDAM GREAT REFRACTOR.—In the *Astrophysical Journal*, vol. xi, pp. 393-399, Prof. H. C. Vogel describes the two new spectrographs which have recently been completed for the great Potsdam refractor of 80 cm. aperture.

(a) *Three-prism spectrograph*.—This is designed so that the combined deviations of the three prisms shall be nearly 180°, thus bringing the collimator and camera almost parallel. These are then mounted on a massive steel plate 78 cm. long, 41 cm. broad, and 7 mm. thick, which in its turn is firmly attached to the tail-piece of the telescope by an elliptical base plate 10 mm. thick, lateral flexure being guarded against by several intermediate metal ribs. The slit has only one movable jaw, and the whole can be rotated round the telescope axis, and the position angle recorded to 1' of arc. For comparison spectra the arc light has been found most convenient, the difficulty of spectral displacement of comparison lines due to imperfect adjustment of source having been overcome by interposing a translucent diffusing screen between the light and slit. The collimator lens (Steinheil) has an aperture of 3.2 cm.; focal length, 48 cm. One of the camera objectives is a Zeiss anastigmat of 56 cm. focus; the other a triple cemented lens by Steinheil of 4.1 cm. aperture; focus, 41 cm. The prisms are of very white Jena glass, and with the Zeiss camera lens a spectrum of uniform focus from b to K is obtained. Delicate arrangements have been made for securing constant temperature conditions, &c. The weight of the complete spectrograph is 31 kilogram.

(b) *Single-prism spectrograph*.—In this instrument the collimator lens is 3.5 cm. aperture, focus 53 cm.; the camera lens, 4 cm. aperture, focus 72 cm., both being triple cemented objectives by Steinheil. The prism is by Zeiss, and has a refracting angle of 60°, with faces 61 mm. long and 45 mm. high. The spectrum is uniformly sharp from D to N. The whole instrument weighs 20 kilograms.

Prof. Vogel gives the results of the application of tests instituted by Prof. W. W. Campbell for the Mills' spectrograph of the Lick Observatory, showing that the performance of both instruments is very trustworthy. Three plates are given showing the instruments in position as attached to the telescope.

STRUCTURE AND CONSTITUTION OF TWO NEW METEORITES.—Messrs. G. P. Merrill and H. N. Stokes recently communicated a paper to the Washington Academy of Sciences (*Proceedings*, vol. ii, pp. 41-68, July 1900), describing the results of their examination of two fragments of newly-fallen meteorites. One, a stony meteorite, fell on July 10, 1899, in Allegan, Michigan, U.S.A., the largest fragment weighing 62½ lbs. To the unaided eye this stone shows on the broken surface a quite even granular structure of grey colour, and, on closer examination, numerous beautifully spherulitic chondrules, averaging not more than one or two millimetres in diameter. In some cases these chondrules have pitted surfaces. More critical inspection indicates that they are composed of enstatite and olivine. Numerous brilliant metallic points of a silver-white colour indicate the presence of disseminated iron, so that the stone may be said to be made up of the chondrules, iron and dark grey silicate minerals, imbedded in a light ashy grey matrix. This Allegan stone is exceedingly friable. Microscopically, the ground mass of the stone is seen to be made up of a confused agglomerate of olivine and enstatite particles with interspersed metallic iron, iron sulphide and chromic iron. An important feature is that in no cases do the silicates occur with perfect crystallographic outlines, both olivine and enstatite being fragmental. The presence of alumina and alkalis suggested a search for feldspar, but it was decided that this mineral was not present. A considerable proportion of the ground mass was found microscopically to be composed of a black glassy material. Careful chemical analysis showed that 77 per cent. of the meteorite was of non-metallic origin, the remainder being chiefly iron and nickel. The second meteorite examined is known as the Mart Iron, having been found early in 1898 near Mart, in Texas. This originally weighed 15¼ lbs., from which a slice weighing 456 grams was presented to the National Museum at Washington. The etched surface shows the iron to belong to the octahedral variety, and is of moderately coarse crystallisation. Chemical analysis showed that 98.3 per cent. of the meteorite was composed of the metals iron, nickel, copper, cobalt, the remainder being made up of schreibersite and a small quantity of troilite.

Photographs of both meteorites in their present condition are given, and numerous drawings indicating the microscopical structure.